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Mid-pregnancy changes in maternal upper body subcutaneous fat assessed using skinfold measurements and oral glucose tolerance test results amongst women with obesity in the UK

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Obesity Facts

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Mid-pregnancy changes in maternal upper body subcutaneous fat assessed using skinfold measurements and oral glucose tolerance test results amongst women with obesity in the UK.

Introduction: In the UK, antenatal care tends to be based on pre-pregnancy body mass index (BMI) and there are no guidelines for gestational weight gain (GWG). However, it is widely acknowledged that maternal obesity and excessive GWG are associated with increased risk of adverse maternal and fetal outcomes such as gestational diabetes mellitus (GDM), and recent studies have suggested a role for the timing and composition of GWG (1,2). Our objective was to examine the effect of changes in maternal upper body subcutaneous fat on maternal plasma glucose values following the 2-hour 75g oral glucose tolerance test (OGTT) routinely used in the UK amongst women with obesity.

Methods: Expectant women (n=75) were recruited at 12 weeks gestation. Maternal height, GWG and body composition were assessed using skinfold thickness (SFT) measurements at the biceps, triceps and subscapular collected at baseline and repeated at 28 weeks gestation. All women took a 2-hour 75g OGTT at the end of their second trimester. Multivariable regression was used to evaluate associations between changes in upper body SFT between early and mid-pregnancy and OGTT results.

Results: The multiple regression model statistically significantly predicted 2-hour plasma glucose values, $F(5,57) = 4.056$, $p=0.03$, adjusted $R^2 = 0.20$, but not fasting plasma glucose values, $F(5, 57) = 2.124$, $p=0.076$. Higher 2-hour plasma glucose values were significantly associated with greater increases in the sum of the upper body SFT measurements in the second trimester, higher maternal age, and inversely associated with previous number of pregnancies. No associations were observed between BMI or rate of GWG during the second trimester and 2-hour plasma glucose values.

Conclusion: Increases in maternal upper body subcutaneous body fat may influence maternal 2-hour 75g OGTT results in women with obesity in the UK more strongly than GWG. Further research is required in larger populations to determine whether the measurement of maternal upper body SFT could be a useful clinical tool alongside weight and/or BMI for identifying women at risk of hyperglycaemia in pregnancy.

References:

1. Catov JM et al. Obesity. 2015;23(5):1071–8.
2. Tomedi LE et al. Matern Child Health J. 2014;18(5):1265–70.

1. Conflict of interest:

None disclosed

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